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UNITED STATES PATENT APPLICATION

FOR

CLEANING DEVICE

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CLEANING DEVICEBACKGROUND OF THE INVENTION1. Field of the Invention

The present invention relates to cleaning devices of a
5 type sometimes referred to a lint removers.

2. Prior Art

Cleaning devices having a roll of adhesive coated sheet
material, typically crepe paper, rolled adhesive coated
surface outward and mounted for rotation about the axis of
10 the roll are well known. The adhesive coated surface picks
up lint, hair, dandruff, etc. when rolled over clothes,
furniture, etc. until the adhesive coating loses its
effectiveness because of the amount of foreign matter it has
picked up. When this occurs, the cleaning ability may be
15 restored by removing the used outer turn of adhesive coated
paper to expose a fresh adhesive coated surface.

Although much thought has been given to how to neatly
tear away the used adhesive crepe paper, manufacturers are
generally not willing to fit sharp metal blades to such
20 devices for reasons of cost and safety. There are two
solutions that are found among products of this category.
These are to either cut a straight line slightly narrower

than the adhesive paper across the adhesive paper roll, or to provide perforated lines in the paper. However the adhesive paper is very thin, and each layer is adhered tightly to the next layer. Therefore it is very difficult to peel away a
5 layer of the paper, especially for users without long fingernails. Furthermore, when the edge of thin adhesive paper is broken in an irregular fashion, it is prone to ripping on the edges when being peeled, making it more difficult to change paper, and possibly even resulting in new
10 adhesive paper underneath also being damaged and wasted.

In order to achieve a thin adhesive paper that is easy to peel away, conventional products of the same category all use complex technology to apply an adhesive substance to the center of the paper backing, leaving the two sides free from
15 adhesive, and making the backing easy to peel away. However, when peeling away and changing the paper, it is easy to tear a single layer of paper, which results in additional trouble.

Also conventional products of the same category are one-piece club-shaped assemblies from the fitting of the adhesive
20 paper to the location of the handgrip and are without a function of folding and opening. They are relatively large in size and also require the addition of a special adhesive protection sheet or coating to cover the adhesive paper, and this presents considerable technical difficulties. The

covering and disassembling actions are extremely troublesome and inconvenient. Furthermore, if the protective sheet is lost, there is no way to protect the adhesive paper.

Additionally, the smoothness of rotation of the adhesive
5 paper is not as good as that of our company's design.

A lint remover having a sticky soft plastic roller uses a folding housing which folds around the roller for protection when not in use, and which opens to form a handle-like protrusion. The housing does not tightly lock in the
10 open position, nor in the closed position, as it has not catch or lock at the ends opposite the hinge area. Also when in the open position, the surface of the handle-like protrusion does not align with the surface of the other housing part, so that the housing, when open, does not have
15 an aesthetically pleasing appearance.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a view of one embodiment of a cleaning device in accordance with the present invention.

Figure 2 is an exploded perspective view of the
5 embodiment of Figure 1.

Figure 3a is a view of the cleaning device of Figure 1 in the open, ready to use condition.

Figure 3b is a local cross section taken along line 3b-3b of Figure 3a.

10 Figure 3c is a local cross section taken along line 3c-3c of Figure 3a.

Figure 4 is a view illustrating the unrolling one layer of used adhesive coated sheet material and aligning the slit at one edge thereof with a sharp edge on one of the body
15 members of the device.

Figure 5 illustrates the pinching of the adhesive coated sheet material against a sharp edge of one of the body members and the tearing of one layer of used material therefrom.

20 Figure 6 is a cross section illustrating the state of the adhesive coated sheet material after one turn of used material has been torn away.

Figure 7 illustrates the folding back of the free edge of the adhesive coated sheet material after a used portion has been torn therefrom, thereby providing a double thickness edge on the roll of adhesive coated sheet material to

5 facilitate the later unwinding of another layer of used material.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

First referring to Figures 1 and 2, a view of one embodiment of the present invention cleaning device in the closed condition and an exploded view of the cleaning device in the open condition, respectively, may be seen. The cleaning device of this embodiment is comprised of first and second body members, generally indicated by the numerals 20 and 22, which when in the closed condition shown in Figure 1, form a substantially continuous surface along the length of the closed device. In that regard, in the specific embodiment shown, the body members are substantially semicircular, thereby forming a substantially round cross section cylindrical enclosure when closed, as shown in Figure 1.

The body members are hinged together adjacent the upper end (using the orientation of Figure 1) with each body member having a pair of hinge members complimentary to the hinge members on the other body member. In the specific embodiment shown, body member 20 has ear shaped hinge members 24 having inwardly projecting hinge pins 26 which may be snapped into holes 28 in projections 30 on body member 22.

Also visible in Figures 1 and 2 are inward projections 32 on the ear shaped hinge members 24 on body member 20, cooperatively disposed with respect to complimentary grooves

34 in projections 30 of body member 22. As may be seen in Figure 1 and in the cross section of Figure 3b taken along line 3b-3b of Figure 3a, the projections 32 snap into grooves 34 when the two body members are folded on the hinges to the closed position of Figure 1, or to the open position as shown in Figure 3. Also, in the specific embodiment shown, a hook latch member 36 is molded integral with body member 22 to hook onto region 38 of body member 20, thereby providing complimentary snap members for further holding the cleaning device in the closed position shown in Figure 1. In the preferred embodiment the body members 20 and 22 are injected molded plastic members having adequate flexibility to allow the complimentary hinge parts to snap together and to resist opening from the closed position and closing from the opening position. Similarly, the operation of the complimentary snap members 36 and 38 is facilitated by the flexibility and elasticity of the plastic.

Also partially visible in Figure 1 is an opening 25 in body member 22. This opening may be used for hanging cleaning devices on a display rack, such as at the point of sale, and for hanging in a users closet if desired.

As may be seen in Figures 2 and 3a, mounted within body member 22 is a roll of adhesive coated sheet material 40 mounted on reusable end pieces 42 which slip into the ends of

the roll 40 and have short, outward extending bearing shafts 44 for snapping within openings 46 in body member 22. The roll 40 in the preferred embodiment is comprised of a tube 48, such as a cardboard tube, with an adhesive coated sheet material 50 rolled adhesive side out on the cardboard 48. In the preferred embodiment, the adhesive coated sheet material is an adhesive coated crepe paper.

As may be seen in Figure 2, the roll of adhesive coated sheet material 40 has a small slit 52 at one end thereof, the slit 52 going through all layers of the multi-layer roll, typically also going partway, if not all of the way, through the cylinder 48 on which it is rolled.

In use, the cleaning device is opened as shown in Figure 7. The outer contour of the body members 20 and 22 provide a substantially uninterrupted surface, serving both an aesthetic and a functional purpose in that the cleaning device may be comfortably gripped by body member 20, as shown in Figure 3a, or with the user's hand spanning both body members, or if desired, gripping only body member 22. Also when in the open position shown in Figure 3a, a small lip 54 on body member 22 snaps into a complimentary recess in member 20 as shown in Figure 3c. In the preferred embodiment, the parts are made with dimensions such that because of the relative location of the hinge axis defined by complimentary

hinge members, there is a slight interference between lip 54 and the leading edge 56 of the recess in body member 20.

This further enhances the snap action for snapping the cleaning device open and for retention of the two body

5 members in the open position.

In use, the adhesive coated roll 40 may be rolled over clothes, furniture, carpets and the like to pick up hair, lint and other debris by the stickiness of the adhesive coated roll 40. After some continued use the roll will begin
10 to lose its stickiness, and accordingly, its efficiency in picking up further debris becomes limited. When this happens, a single turn of sheet material is unrolled from the roll 40 (see Figure 4) so that the next slit 52 aligns with the outer edge 58 of body member 22. Then the two body
15 members 20 and 22 are closed as shown in Figure 5. It will be noted from Figure 6 that one of the body members has a relatively sharp outer edge 60, with the complimentary body member having an incline 62 to cooperatively engage the relatively sharp edge 60. Thus by holding the two body
20 members closed as in Figure 5, the adhesive coated sheet material 50 is squeezed or pinched between the sides of the two body members. This, in cooperation with the slit aligned with the sharp edge 60 to facilitate initiation of tearing, allows the tearing of exactly one turn of the used adhesive
25 coated sheet material 50, Figure 6 showing a cross section

after the tearing is complete. Now on opening of the cleaning device, the free edge 64 (see Figure 6) that was pinched between the two body members may freed by rotating the roll, and when freed, the free end of the adhesive coated sheet material may be folded back 180° to form a strip 66 (see Figure 7) that is folded, adhesive side versus adhesive side, to create a double thickness leading edge on the roll. While this creates a narrow strip of the uncoated side of the sheet material across the adhesive coated roll 40, it is relatively narrow and has very little effect on the cleaning ability of the adhesive coated roll. However, once the newly exposed turn of adhesive coated sheet material becomes depleted through use, the double thickness leading edge of that layer is very much less prone to ripping, thereby greatly facilitating the peeling of an additional turn from the roll for tearing off, etc. to expose still another fresh adhesive coated surface.

Thus the structure and operation of the product has many differences and advantages over conventional products of the same category. The preferred embodiment is comprised of a cylindrical receptacle using a roll of adhesive crepe paper, the ends of which are fitted with round plastic fasteners and then enclosed by two plastic casings. Utilizing the sticking power of the adhesive paper, lint, fibers, hair, dandruff and scraps of paper that have fallen onto clothing, pillows,

fabric covered furniture and fabric covered car seats can be rolled clean. It can also be used for cleaning away mess left behind by pets, such as dog or cat hairs, etc.

The product's innovative features include a new method
5 for neatly tearing the adhesive coated sheet material,
preferably adhesive coated paper. Specifically, a small cut
or slit is pre-cut on the edge of the roll of adhesive paper
so that when the adhesive paper is covered in lint and other
residue and begins to lose its adhesive effect, users can
10 peel the used adhesive paper back to the small cut at the
position of a sharp angle edge on the receptacle. Closing
the receptacle re-fastens the adhesive paper. Users can tear
away used adhesive paper by hand from the point of the small
cut and a tidy tear of the adhesive paper can be achieved
15 without using sharp blades.

The product's innovative features also include a new
method for the perfect formation of easy peeling of the
adhesive coated paper. After completing the key action of
neatly tearing away the adhesive paper, one can open the
20 receptacle and use their hand to rotate the adhesive paper
slightly in a pulling out direction, enabling the neat tear
of the adhesive paper to leave the sharp angled edge of the
receptacle. This also enables one to obtain just the right
length of adhesive paper to match the casing.

After that, the free end of the roll of adhesive paper is wound back to perfectly form a paper head the thickness of two layers of adhesive. This not only allows users to peel away and change paper easily, but also greatly increases the strength of the paper edge, preventing it from ripping when attempting to peel back another layer. Without using this method, because the adhesive paper is very thin and is adhered tightly to the lower layer, it would be very difficult to peel away paper, especially so for users without long fingernails. Furthermore, when the edge of thin adhesive paper is broken in an irregular fashion, it is prone to ripping on the edges when being peeled, making it more difficult to change paper and possibly even resulting in new adhesive paper underneath also being damaged and wasted.

The product's innovative features further include an original multi-functional plastic receptacle. When the receptacle is opened 180 degrees, the body members work together with ergonomic principles and can be used as a gripping handle. The hidden locking fastener inside the receptacle is both easy to open and can be closed tightly in all safety. It also provides the greatest level of protection against adhesive sticking to unwanted areas when not in use, and dust, lint and other floating substances in the air sticking to the adhesive paper and reducing its adhesive effect. Also the contact area between the rotating

axle centers of the fasteners or reusable end caps 42 supporting the roll of adhesive paper is very small and has a low friction coefficient, allowing the adhesive paper to roll extremely smoothly and easily.

5 The method used by the sharp angled edge of the receptacle and the casing to grip the adhesive paper allows for the neat breaking of paper and also allows the leading edge of the paper to stand up in a regular fashion. This enables users to easily bend back and form a leading edge
10 that can be easily peeled away.

When the adhesive characteristics of the outer layer of the roll of adhesive paper is depleted and needs to be replaced, one can use their fingers to grasp the two circular fasteners to take off the paper core. In that regard, the
15 outer surface 70 (see Figure 2) of the reusable end caps 42 is intentionally patterned in some way to provide a non-slip gripping surface. The two circular fasteners 42 can then be fitted to a new roll of adhesive paper and that assembly fastened into the body member 22 by first inserting one
20 bearing shaft 44 (Figure 2) into one of the openings 46 in body member 22, and then squeezing the other fastener into the remaining opening 46.

The opening joint of the receptacle is made up of two ear-shaped fasteners that fasten to the two openings on the

other half of the receptacle and allow a 180-degree opening action. At the same time, the inherent elasticity of plastic is utilized in an arched channel that extends out and prevents the handgrip from swinging freely when fastened. To
5 close the receptacle, one merely has to fold the handgrip gently by hand and it will release and close. The shape of the receptacle is pocket-sized and not awkward. It can be stably placed in a vertical position and can also be hung from a hole. These features make it very convenient to
10 display, carry or store.

A new and unique cleaning device having a number of features has been disclosed herein. However it is to be understood that each of these features may be advantageously practiced alone, or practiced in various combinations and
15 sub-combinations in products of the described type. Thus while a preferred embodiment of the present invention has been disclosed and described herein, it will be understood by those skilled in the art that various changes in form and detail may be made therein without departing from the spirit
20 and scope of the invention.